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METHOD FOR DETERMINING A WARRANTY START DATE

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Field of the Invention

22 The present invention is related to methods for determining a warranty

23 start date. More particularly, the present invention is related to a method for

24 accurately determining the date of a warranty start event such as a product first

25 use date for products that may comprise computer peripherals.

26

27 ## Background of the Invention

28 Most durable products are provided with a warranty. Under the terms of

29 the warranty, the product manufacturer may guarantee the satisfactory

30 performance of the product for a period of time referred to as the "warranty

31 period". The manufacturer may agree under terms of the warranty to repair,

32 replace, or to otherwise service the product upon the occurrence of a defect,

1 malfunction, or other problem during the warranty period. The length of the

2 warranty period varies between products and manufacturers. Depending on

3 these factors, typical warranty periods may range from 90 days to 3 years.

4 Providing an effective warranty period, and in particular determining the

5 start of a warranty period, has proven difficult. Although the date of

6 manufacture of a product may be known with precision by the manufacturer,

7 this has not proven to be a satisfactory warranty start date. In many instances

8 products are manufactured and then enter a distribution chain where they may

9 be shipped and warehoused several times before they arrive at the ultimate

10 seller. Once at the ultimate seller, the product may be stored for another period

11 of time before sale. This can result in a significant time lapse between

12 manufacture and ultimate sale, with the result that consumers are unfairly

13 penalized if the date of manufacture is used as a warranty start date.

14 As a result, most present day warranties begin on the date of purchase.

15 While this has solved a few problems related to date of manufacture warranty

16 start dates, it has introduced new sets of problems. For example, it is difficult

17 for the manufacturer to know the date of actual sale to an end user. Users may

18 be required to mail product documentation, sales receipts, and the like to the

19 manufacturer to mark the start of a warranty. Because of the effort required,

20 purchasers often do not comply, which can lead to loss of warranty rights and

21 resultant low customer satisfaction. To avoid this low customer satisfaction,

22 manufacturers may waive requirements when an end user has a product failure

23 and instead rely on the end user's affirmation alone that the product was

24 purchased on a date that places the failure within the warranty period. Such

25 reliance, however, can disadvantageously lead to lengthened warranty periods

26 as end users may fabricate purchase dates to obtain warranty coverage.

27 Additional problems with purchase based warranty start dates relate to

28 users that may purchase a product but not use it for a prolonged period.

29 Business purchasers, for instance, may purchase products such as computer

30 peripherals that are shipped and stored after purchase before actual use. This

31 can disadvantageously delay the actual product use for substantial time periods

1 after purchase. For these users, the warranty period is effectively shortened

2 because of the delay between purchase and actual use of the product.

3   These and other unresolved problems remain in the art.

4

5   **Summary of the Invention**

6   The present invention is directed to a method and a computer program

7 product for determining a warranty start date for a product. An embodiment of

8 a method of the present invention generally comprises the steps of: defining a

9 warranty start event, generating a timestamp with the product after the

10 occurrence of the warranty start event, and using the timestamp as the warranty

11 start date. The timestamp is stored for reference in a memory that is preferably

12 internal to the product, but may also be remote from the memory and accessed

13 over a network. Further, the timestamp may preferably be reported by the

14 product over the network to a warranty database for manufacturer record

15 keeping.

16   Preferably, the product is a computer peripheral such as a printer,

17 facsimile machine, copier, or the like that produces documents. In this

18 preferred embodiment, the warranty start event may comprise production of a

19 specified number of documents, and the timestamp may be obtained through

20 query of a time server over the network. In additional embodiments of the

21 invention, the warranty start event may comprise other events, with examples

22 comprising first power-up, installation of a driver, connection to a network, and

23 the like. Preferred warranty start events may also allow for preliminary

24 product testing or demonstration without triggering the warranty start period.

25 Still additional preferred steps of various embodiments of the invention also

26 comprise encrypting the timestamp prior to saving in the memory, and

27 outputting the encrypted timestamp from the product in the form of a

28 diagnostic indicator for reporting to the manufacturer.

29   The present invention thereby provides a novel and elegant solution to

30 many of the otherwise heretofore unresolved problems in the art. For example,

31 a warranty start date is provided based on a defined event such as date of first

1 use that solves problems of the prior art related to purchase date or manufacture

2 date warranty starts. Additionally, the warranty start date is accurately

3 generated by the product itself without required user action. This solves

4 warranty start date problems in the art related to user inaction or user

5 fabrication.

6 Those knowledgeable in the art will appreciate that the present invention

7 lends itself well to practice in the form of a computer program product.

8 Accordingly, additional embodiments of the present invention comprise

9 computer program products for causing a product to determine a warranty start

10 date, the program product comprising computer executable instructions stored

11 in a computer readable medium that when read by the product causes the

12 product to execute the general steps of method embodiments of the invention.

13 The above brief description sets forth broadly some of the more

14 important features and advantages of the present disclosure so that the detailed

15 description that follows may be better understood, and so that the present

16 contributions to the art may be better appreciated. There are, of course,

17 additional features of the disclosure that will be described hereinafter that form

18 the subject matter of the claims appended hereto. In this respect, before

19 explaining the embodiment of the disclosure in detail, it is to be understood that

20 the disclosure is not limited in its application to the details of the construction

21 set forth in the following description or illustrated in the drawings. The present

22 invention may provide additional embodiments, as will be appreciated by those

23 knowledgeable in the art. Also, it is to be understood that the phraseology and

24 terminology employed herein are for description and not limitation.

25

26 **Brief Description of the Figures**

27 FIGURE 1 is a flow chart illustrating steps of one embodiment of the

28 method and computer program product of the invention.

29

1 **Detailed Description**

2 Turning now to the drawings, FIG. 1 is a flow chart that will be helpful

3 in describing a method embodiment as well as a computer program product

4 embodiment of the invention. In this respect it will be appreciated that the

5 present invention lends itself well to practice in the form of a method as well as

6 a computer program product. Description made herein of an invention method

7 embodiment may therefore likewise apply to a computer program product

8 embodiment, with the understanding that the computer program embodiment

9 will cause a computer to perform the method steps as described.

10 As an initial step of a method embodiment, a warranty start event is

11 defined and stored in a memory (block 2). In a corresponding computer

12 program product embodiment, the program product may cause a computer to

13 retrieve a stored warranty start event from the memory. In either case, a

14 "warranty start event" as used herein is intended to refer to an event that upon

15 occurrence will mark the beginning of a warranty period. A preferred warranty

16 start event comprises the date of first use of a product.

17 In preferred embodiments of the method and program product of the

18 invention, including the embodiment illustrated in the flow chart of FIG.1, the

19 invention is for practice with a computer peripheral that produces document

20 output, such as a printer, scanner, facsimile machine, multi-function machine,

21 or the like. Under this preferred practice, then, the date of first use may

22 correspond to the date of first document production.

23 Additional preferred invention steps allow for further definition of first

24 use to accommodate demonstration, testing, or other peripheral use that may

25 occur prior to "actual" customer usage. These preferred steps may comprise,

26 by way of example, marking the date of first use as the time that a specified

27 cumulative output has been reached, the time that output reached a specified

28 level of daily output, or the like. In taking practice of these preferred invention

29 steps with a printer by way of example, the warranty start date may be defined

30 as the first day that total cumulative page output has reached ten, or the first

31 day that daily output reaches three pages, or the like. Further, a level of output

1   of zero could be specified as the warranty start event, with the result that the

2   event would occur at initial power up of the product.

3   Other warranty start events in addition to date of first use may of course

4   be comprised in the practice of other invention embodiments. For practice with

5   computer peripherals, for example, a warranty start event may be defined as the

6   installation of a peripheral driver or installer software tool. This is a less

7   preferred alternative to date of first use, however, as it has been found that

8   peripherals are often used with drivers or install tools other than those provided

9   with the peripheral. Other examples of warranty start events comprise first (or

10   other specified number) power up of the product, first (or other specified

11   number) connection of the product to a network, or first (or specified number)

12   power up of the product when network connectivity exists.

13   The warranty event is stored in memory, illustrated as block 4 in FIG. 1.

14   Preferably, the memory comprises a non-volatile memory within the product.

15   As used herein, the term "non-volatile memory" is intended to refer to memory

16   that does not require continuous power to retain data. Those knowledgeable in

17   the art will appreciate that a wide variety of such memory media are available

18   that include, but are not limited to, magnetic and optical media, flash memory,

19   circuitry, and the like. Also, the present invention is not limited to practice

20   with memory that is internal to the product. Indeed, the memory used may be

21   external to the product, and may for instance comprise a memory available on a

22   locally connected computer, or memory available over network access.

23   Once a warranty start event has been defined or retrieved, method and

24   computer program product embodiments of the invention comprise a

25   subsequent step of determining whether the event has occurred (block 6).

26   When practicing the invention with products such as computer peripheral

27   document production apparatuses, performing this step may comprise for

28   example determining when a specified cumulative number of pages have been

29   output. Those knowledgeable in the art will appreciate that there are a number

30   of ways to monitor number of pages output, with examples including counter

31   mechanisms.

1   The embodiment of the method and program product of the invention
2 illustrated in the flow chart of FIG. 1 comprises a step of continually searching
3 for the occurrence of the warranty start event (block 6). As used herein, the
4 term "continually searching" is intended to refer to a repeated search at
5 approximately equal intervals. By way of example, "continual searching" as
6 used herein could comprise execution of a computer executable loop that looks
7 for the occurrence of the event at intervals from anywhere of the order of
8 seconds to the order of hours. As warranty periods are most often defined in
9 periods of days, it is preferred that occurrence of the warranty event is searched
10 for with a frequency that will allow for an accuracy of less than a day to occur
11 (i.e. determine time of warranty event to within a day). Further, the present
12 invention is not limited to the determination of a warranty start date in units of
13 a day, but may likewise be practiced to determine a warranty start date with
14 any practical time unit, including but not limited to seconds, minutes, hours,
15 weeks, months, or years.

16   Regardless of the desired units, once a warranty start event has been
17 detected, this method and computer program product embodiment of the
18 invention proceed to a group of steps for generating a timestamp that will serve
19 as the warranty start date. As used herein, the term "timestamp" is intended to
20 refer to a value that reflects the current time. The invention embodiment as
21 illustrated in FIG. 1 first determines whether network connectivity exists (block
22 8). If it does, the invention embodiment proceeds to obtain the current time
23 over the network (block 10).

24   As will be appreciated by those knowledgeable in the art, there are a
25 number of methods for obtaining a current time value over a data network.
26 Preferably, the invention embodiment comprises generating a network time
27 protocol ("NTP") query to a time server. Also preferably, a time value is
28 returned in a standard format such as UTC ("Universal Coordinated Time").
29 Other sources and formats for time values are of course also suitable for
30 practice with the current invention, with sources and formats that allow for a
31 suitable degree of reliability preferred. It is noted in this regard that a great

1   deal of accuracy may not be required for the timestamp of the invention. That

2   is, it may not be required to determine a warranty start date to a degree of

3   accuracy of seconds or minutes. Accuracy of no more than a day may in fact

4   be useful.

5   The network time server may be located by inquiry to a known server

6   address stored in the memory. An Internet protocol address for a time server or

7   for a well known web address, for example, may be stored in memory and

8   accessed over the Internet for location of a time server. A plurality of potential

9   timer server addresses may be stored and checked in succession until an

10   available server is located. Additionally, a search may be made for an

11   available time server. Finally, if network connectivity exists but no time source

12   can be located over the network, embodiments of the invention may comprise

13   querying a user for input of a time source location over the network.

14   If no network connectivity exists, this invention embodiment proceeds

15   to steps for determining whether a local time source is available (block 12).

16   Such a source may comprise, by way of example, a clock function on a

17   computer device connected to the peripheral. This clock function could be

18   queried through a system level call to the computer operating system or

19   through other steps of interfacing with the operating system, peripheral driver,

20   or other application running on the computer that is capable of reporting time.

21   Additional "local" time sources could likewise be practiced within the scope of

22   the invention as claimed, with a wireless query to a satellite, beacon, or like

23   based times source; and query to a user requesting input of a current time value

24   other examples. Once a current time value has been obtained, whether it has

25   been generated by a local or a network source, the timestamp is set equal to the

26   time value (block 16).

27   It is noted that some time sources such as personal computer operating

28   systems may be less reliable than standard network sources, and may leave the

29   method of the invention subject to disadvantageous inaccuracies, and perhaps

30   even manipulation. That is, time sources that require setting or updating by

31   users can lead to inaccurate warranty start times if they are not properly set.

1   For this reason standardized and reliable time sources such as network time

2   servers are preferred in the practice of the invention.

3   If network connectivity does not exist, and no local time sources are

4   available, this embodiment of the invention proceeds to retrieve the date of

5   manufacture from the memory (block 18) and to set the timestamp equal to this

6   value (block 20). While the date of manufacture is disadvantageous to the user

7   as a warranty start date, when no other time sources are available it is used with

8   the general consideration that having some date is more advantageous than not

9   having any date. Also, the date of manufacture is generally present in the

10   memory for computer peripherals. Finally, from the manufacturer point of

11   view, if no accurate source for a current time value is available and a date must

12   be estimated for a warranty start date, a conservative estimation of the date of

13   manufacture may be advantageous in that it will shorten the warranty period.

14   The invention may further comprise storing an indicator to indicate that the

15   warranty start date is the date of manufacture. This may be useful so that the

16   manufacturer is alerted that the warranty start date is likely not accurate.

17   A still additional method embodiment comprises consulting an internal

18   clock for obtaining a time stamp. Providing an internal time clock may not be

19   the most preferred step for some products, as cost of the clock will be entailed.

20   This may be mitigated, however, in that a clock of great accuracy is not

21   required. A timestamp for warranty purposes may be useful with an accuracy

22   of no greater than hours or even a day. Also, for products such as computers

23   that are provided with internal time clocks for other purposes, the step of

24   consulting an internal time clock will not be as disadvantageous.

25   Once a timestamp has been obtained, it is preferably encrypted (block

26   22), and placed in memory (block 24). Storage may be in any suitable formats,

27   with examples comprising YYYYMMDD numeric codes. Encryption has the

28   advantage of making the timestamp reportable by a user without knowledge of

29   its contents. By way of example, additional steps of a preferred invention

30   embodiment may comprise printing the encrypted timestamp on a diagnostic

31   test page when the invention embodiment is practiced with a printer product.

1   When subsequently seeking warranty service for the printer, the user could be

2   requested to print a diagnostic page that included the encrypted timestamp.

3   Upon reporting the encrypted timestamp, the manufacturer could then very

4   quickly determine whether the printer was within the warranty period.

5   Methods for encryption are generally known in the art, and for sake of brevity

6   will not be discussed in any detail herein. By way of brief example, encryption

7   generally comprises steps of encoding plain text into a encrypted format, with

8   the thus encrypted format able to be converted back to its un-encrypted format

9   by use of an encryption key.

10   Although not illustrated in the flow chart of FIG. 1, additional steps of a

11   preferred invention embodiment comprise reporting the timestamp over the

12   network to a warranty database. Preferably, the timestamp is reported along

13   with a product identifier such as a product serial number for identification

14   purposes. Further, the timestamp is preferably stored in the memory in a

15   standardized manner such that it may be obtained through a query over the

16   network. The warranty start date may thus be remotely obtained as desired for

17   service or other purposes.

18   As discussed herein above, the present invention lends itself well to

19   practice in the form of a computer program invention. Accordingly, it will be

20   understood that various embodiments of the present invention comprise

21   computer program products for causing a product to determine a warranty start

22   date, with the program products comprising computer readable instructions

23   recorded in a computer readable medium that when executed cause the

24   computer to execute the steps of determining a warranty start date. Preferred

25   examples of computer readable mediums include, but are not limited to,

26   magnetic and optical media such as disks and the like, circuitry, embedded

27   circuitry, and the like. The instructions may comprise programming language

28   instructions such as Java, C++, visual basic, native code, and the like that

29   preferably have been compiled into a machine executable format.

30   Also, it will be appreciated that as used herein the term computer is

31   intended to refer to an apparatus having a processor capable of executing

1 computer program instructions. Thus, as used herein, computer peripherals

2 such as printers, copiers, facsimile machines, and combination machines

3 having processors may all be considered "computers". A preferred

4 embodiment of a computer program product of the invention, in fact, is

5 practiced on a printer having a processor for executing the various instructions

6 of the program product. This program product may comprise Java code, or a

7 Java virtual machine, being executed by a processor of the printer.

8   Those knowledgeable in the art will appreciate that the present invention

9 may be practiced in various ways and embodiments other than those discussed

10 and illustrated herein. For example, the various actions of the flow chart of

11 FIG. 1 would be carried out in a sequence other than that illustrated within the

12 scope of the invention as claimed. Further, various of the actions illustrated

13 could of course be combined or separated. By way of example, the date of

14 manufacture, the warranty start event definition, and the timestamp may all be

15 stored in separate memories. The memories may be any combination of

16 mediums, and may be internal or external to the product.

17   Further, practice of the invention may comprise providing a plurality of

18 warranty start dates for a plurality of warranties. By way of example, a printer

19 product may have a first warranty covering a color printing mechanism and a

20 separate warranty on the remainder of the product. A first warranty start event

21 could then be defined as a printing of a desired cumulative number of color

22 pages, with a second warranty start event defined as the printing of a

23 cumulative number of pages regardless of color or black and white.

24   In addition, although practice of the invention with computer peripherals

25 has been discussed herein, it will be appreciated that the invention will be

26 useful for practice with a wide variety of products. Although products that may

27 be connected to a network are preferred, practice with other products is

28 likewise practical. Examples of additional products suitable for practice of the

29 invention include, but are not limited to, computers; handheld computer

30 devices; communications devices such as phones and radios; machine tools;

1   electronics such as televisions, registers, security systems, and the like;

2   industrial equipment such as electronic tools and vehicles; and the like.

3   The advantages of the disclosed invention are thus attained in an

4   economical, practical, and facile manner. While preferred embodiments and

5   example configurations have been shown and described, it is to be understood

6   that various further modifications and additional configurations will be

7   apparent to those skilled in the art. It is intended that the specific embodiments

8   and configurations herein disclosed are illustrative of the preferred and best

9   modes for practicing the invention, and should not be interpreted as limitations

10   on the scope of the invention as defined by the appended claims.

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